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DEEP DRAFT COMPREHENSIVE ENERGY STRATEGY

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You asked for a summary of the Department of Energy and Environmental Protection's draft 2012 Comprehensive Energy Strategy.

SUMMARY

The draft 2012 Comprehensive Energy Strategy issued by the Department of Energy and Environmental Protection (DEEP) in October 2012 presents a series of policy proposals intended to expand energy choices, lower utility bills, improve environmental conditions, and create clean energy jobs. It focuses on five, sometimes overlapping, energy strategy sectors: natural gas, energy efficiency, electricity, industry, and transportation. Although the strategy contains significant research findings, this report focuses mainly on the recommendations proposed as a result of those findings within each sector.

In discussing the natural gas sector, the strategy concludes that natural gas is a cheaper, cleaner, and more reliable fuel for heating, power generation, and possibly transportation. It recommends a variety of proposals intended to encourage (1) people to convert their homes and businesses to natural gas and (2) gas utilities to expand their infrastructure.

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For energy efficiency, which the strategy identifies as the most cost effective way to reduce energy bills, the strategy recommends improving funding for efficiency programs and expanding the programs to include more potential customers. The recommendations for the electricity sector similarly stress the importance of efficiency measures, but also propose measures to reduce electricity use, promote and expand renewable energy systems, and increase system reliability. Recommendations for the industry sector generally focus on adapting the gas, efficiency, and electricity proposals to the specifics of industrial needs, but also include suggestions to encourage water conservation and create an Advanced Energy Innovation Hub.

The strategy's recommendations for the transportation sector focus on reducing the amount of gasoline and diesel fuel consumed in the state while encouraging the availability of a diverse refueling infrastructure.

BACKGROUND

PA 11-80 required DEEP, in consultation with the Connecticut Energy Advisory Board (CEAB), to develop a comprehensive plan (which it calls a strategy) that incorporates existing energy efficiency and renewable energy plans. Among other things, the act required the plan to include:

1. an assessment and plan for all energy needs, including electricity, heating, cooling, and transportation;

2. the findings of the integrated resources plan, which seeks to meet future electric demand through a mix of efficiency and supply resources;

3. an assessment of energy supplies, demands, and costs, and factors likely to affect them;

4. long-range energy policies to achieve a sound economy and the least-cost mix of energy supply sources and measures that reduce energy demand, while also considering such factors as price impacts, public health, and environmental goals; and

5. recommendations for administrative and legislative action.

The act requires the Public Utilities Regulatory Authority (PURA, formerly the Department of Public Utility Control) to provide input on the proposed plan's impact on ratepayers, and allows a 45-day public comment period. Once finalized, the act requires the DEEP commissioner to publish the plan electronically and summarize all public comments and any changes that resulted from them.

The act requires the commissioner must submit the plan to the General Assembly's committees on energy and the environment. He can subsequently modify the plan in consultation with CEAB under the same procedures the act required for the initial plan.

NATURAL GAS

Over the last several years, the emergence of new extraction techniques (most notably hydraulic fracturing or "fracking") have brought enormous amounts of natural gas supply to the marketplace from shale basins, including the Marcellus formation in the Northeast. As a result, the price of natural gas is well below that of heating oil on an energy-equivalent basis. According to the draft strategy, natural gas is currently 60-75% cheaper than fuel oil, 70-80% cheaper than propane, and 75-85% cheaper than electric resistance heating.

While DEEP acknowledges that there are significant environmental and public health issues associated with the drilling and transport of natural gas, it argues that the development of these gas resources allows gas to serve as a cheaper, cleaner, and more reliable fuel for heating, power generation, and perhaps transportation.

Promoting Natural Gas Use and Fuel Switching

The draft strategy states that only 31% of Connecticut homes currently heat with gas, compared with 47% in Massachusetts and 48% in Rhode Island. The percentage of commercial and industrial entities with access to gas is only slightly higher. The strategy proposes to make gas available to as many as 300,000 additional Connecticut homes and businesses, beginning with the roughly 217,00 customers who are on gas mains now but not heating with gas. Specifically, it calls for:

1. establishing financing options to eliminate the upfront cost of converting furnaces, boilers, and other heating equipment to gas, with the cost of the replacement equipment initially funded by banks and the capital market and recovered by the gas companies over a decade through an "on-bill repayment" system;

2. providing alternative financing for low-income homeowners through community banks and credit unions with the state providing incentives or financing through the Clean Energy Finance and Investment Authority (CEFIA);

3. making regulatory changes, such as extending the time gas companies have to recover their costs for expanding their distribution systems from the added revenues of the new customers;

4. building roughly 900 miles of gas mains, with a focus on providing access to gas mains for "anchor loads" such as factories, hospitals, schools, and other facilities with significant energy consumption;

5. providing incentives for the gas companies to ramp-up the required construction quickly; and

6. linking utility construction projects so that the construction costs of new gas mains can be shared with those installing water or sewer pipes, fiber optic cables, or underground electric lines.

Costs and Benefits of the Proposals

The strategy estimates that converting heating equipment to gas will cost about $3 billion, which it proposes to be funded by private capital. Connecting residents and businesses on or near gas mains would cost roughly $815 million, and the draft strategy proposes that these costs be financed by the gas companies and their customers. An additional $1.4 billion would be needed to construct new gas mains, which the strategy proposes to fund from a combination of new gas customers, existing gas ratepayers, and bonding.

DEEP estimates that the conversion program would save the average participating household about $800 per year. It estimates that the expansion of the gas distribution system would generate about 7,000 jobs. In addition, the state economy would get a boost from the savings in energy costs being spent on other goods and services, instead of energy. In addition, there would be wider benefits to the country as a whole from energy dollars being spent on a domestic energy source instead of foreign oil.

DEEP estimates that the proposals would result in $2.8 billion in net present value over 20 years, with the great majority of the value (90% or $2.6 billion) coming from converting residents and businesses that are on or near existing mains to gas. In addition to its economic benefits, the

strategy argues that fuel switching would bring environmental gains, lowering emissions of federally regulated pollutants such as sulfur and nitrogen oxides, particulate matter, and carbon dioxide.

Potential Risks

While this analysis shows economic benefits for expanding natural gas use, DEEP acknowledges the risks involved in a large-scale conversion strategy. Natural gas prices could rise unexpectedly as more electric generation switches from coal or oil to natural gas. An expansion in natural gas exports could redirect United States gas supplies to markets in Asia and Europe where gas prices are much higher, driving up the price of natural gas here. Additionally, reserves could prove more difficult to access than currently thought. Fuel consumption could drop because of the investment of energy efficiency measures called for in the draft strategy, reducing the potential savings from natural gas conversion. Potential negative environmental impacts from "fracking" such as groundwater contamination, methane leakage, or other damage to the environment or public health could require regulatory changes in the areas where natural gas is produced and slow the pace of drilling and drive up the costs of gas.

For a more detailed discussion of potential benefits, costs, risks, and uncertainties of promoting natural gas use in Connecticut, see OLR Report 2012-R-0478.

ENERGY EFFICIENCY

According to the draft strategy, investing in energy efficiency measures is one of the most cost effective ways to reduce energy bills that annually total $8.1 billion state-wide to heat, cool, light, and provide hot water for buildings. The strategy's recommendations for increasing energy efficiency focus on (1) improving conservation and load management programs, (2) leveraging private capital to support efficiency investments, (3) developing a strategy to help low-income customers make efficiency improvements, (4) enacting regulatory changes to expand efficiency opportunities, and (5) fostering a market for energy efficiency products and services.

Conservation and Load Management Programs

The strategy recommends increasing the funding for electric efficiency programs from its current $105 million (funded by the conservation assessment of $0.003/ kWh and other revenues) to $206 million annually. This increase could allow the state to achieve all cost-effective savings and offset expected increases in electricity consumption.

The strategy recommends that efficiency programs be available to customers of all fuel types, including oil, and suggests that the legislature levy a surcharge on fuel oil (similar to the conservation charge on electric bills) to support greater efficiency measures for fuel oil customers.

The strategy further suggests that existing efficiency programs be revamped to encourage contractors and vendors to promote the maximum amount of residential efficiency (i.e. measures beyond lighting changes and air sealing). These steps could include rewarding contractors and vendors who successfully promote these "deeper" efficiency measures and developing a licensure standard for contractors participating in the Home Energy Solutions (HES) program.

Leverage Private Capital to Support Efficiency Investments

In conjunction with increasing ratepayer funding for efficiency programs, the strategy proposes developing new financing programs to leverage private capital to support efficiency investments. It recommends that the state create two pilot programs to finance residential energy efficiency upgrades: (1) a low or no interest rate loan program and (2) an "on-bill" financing program that will allow customers to pay for efficiency equipment upgrades through their monthly utility bills.

In both instances, private capital would supply the loans. For low or no interest rate loans, CEFIA would establish a loan loss reserve, interest rate buy down or other credit enhancement mechanism to support affordable interest rates. With on-bill financing, loans could be structured so that the savings from efficiency improvements are greater than repayment costs, thus potentially lowering customers' utility bills even as they pay for their improvements. To be attractive to lenders, the on-bill program might also have to include provisions that allow for (1) utility service to be shut off for nonpayment and (2) the debt obligation to stay "with the meter" if the property is transferred or sold.

The strategy also recommends that municipalities pass resolutions enabling them to work with CEFIA in the Commercial Property Assessed Clean Energy (C-PACE) program created by PA 12-2. This tax-lien financing program will allow certain commercial property owners to finance qualified energy efficiency improvements on their properties through an additional charge on their property tax. According to the strategy, C-PACE will allow low interest financing to be raised from the private sector with no government financing because repayment is tied to the property tax. For additional information on the C-PACE program see OLR Report 2012-R-0464.

Low-Income Strategy

The strategy offers several suggestions to expand the use of energy efficiency measures by helping ensure that low-income residents can participate in the state's energy efficiency programs. These include:

1. developing a program to support "pre-weatherization" measures addressing health and saftey code violations (e.g. asbestos removal) in older buildings that often prevent owners from participating in efficieny programs,

2. incorporating energy efficiency measures into state-administered housing upgrades,

3. improving existing means-tested energy assistance programs,

4. developing efficieny programs to address "split incentives" where a building's owner does not pay for its utilitites, and

5. expanding outreach and financing options for businesses in low-income communities.

Regulatory Changes to Expand Efficiency Opportunities

Because utilities traditionally make more money by selling more electricity or gas, they have little financial incentive to promote energy efficiency measures. The strategy recommends "decoupling" utility revenues from their sales volume to remove this disincentive and replacing it with performance incentives or a performance-based return on equity to create an incentive to boost efficiency.

The strategy also advises the state to (1) adopt and enforce the latest codes and standards to ensure high-performance buildings, (2) provide adequate resources to train local building inspectors on the new codes, and (3) continue to adopt improved appliance standards.

Foster a Market for Energy Efficiency

To help foster a market for energy efficiency products and services, the strategy recommends developing residential marketing efforts to increase awareness about efficiency programs, their benefits, available contractors, and the options to pay for them. It also suggests compiling energy efficiency data into a database available for customers to see the relative efficiency of their homes and cost effective opportunities to improve their efficiency.

The strategy also recommends developing a voluntary residential building energy labeling pilot program. Participants would receive a label or information sheet summarizing a building's energy efficiency that could be included as part of the disclosure when selling the building. The label could help buyers make more informed decisions and potentially reward sellers for having made energy efficiency improvements in their property by increasing its value.

ELECTRICITY

While the cost of electricity in the state has decreased since 2009 and natural gas-fired power plants have largely displaced older coal and oil-fired facilities, the draft strategy offers numerous recommendations intended to make the state's electricity sector less expensive, environmentally cleaner, and more reliable. Some, such as expanding efficiency program funding and decoupling electric company rates, have been summarized in the above section on efficiency recommendations.

Peak Demand Reductions and Time-of-Use Pricing

The strategy recommends increasing public awareness about peak demand reduction programs, which generally provide incentives for larger customers to reduce their electricity demands when the overall demand for electricity is at its greatest. It calls for the state to invest in technology that will help smaller customers to participate.

The strategy also recommends expanding time-of-use pricing and other dynamic rate mechanisms that create a financial incentive for customers to reduce their electricity usage during peak demand hours. These pricing systems, which increase a customer's rates during periods

of high demand, require advanced metering capabilities. While the meters of United Illuminating (UI) customers currently have these capabilities, Connecticut Light and Power's (CL&P) meters do not.

To address the metering difference in the two utilities, the strategy recommends that CL&P submit a plan for a multi-stage rollout of advanced meters that minimizes stranded costs, prioritizes adoption by customers most likely to benefit from their use, and offers hybrid rate structures for customers who choose not to participate. It recommends that CL&P not promote time-of-use rates to its residential customers until the advanced meters are available.

Since UI already has advanced metering capabilities and, in some instances, time-of-use rates, the strategy recommends UI promote time-of-use rates to all of its residential and small business customers.

Virtual Net Metering

When an on-site distributed generation facility (e.g. solar panels) produces more electricity than the site uses, virtual net metering allows the facility's owner to "run the meter backward" on other metered accounts that are not physically connected. Because this surplus production reduces load within the electric company's distribution territory, but does not result in a payment to the company for distribution costs, the retail electricity rate paid to a virtual net metering facility's owner requires a subsidy paid for by other rate payers.

In response, the strategy recommends exploring different ways to help expand virtual net metering without unduly burdening rate payers and utilities. It suggests considering (1) a variable power purchase schedule that establishes fixed credit amounts, (2) a varied rate schedule, or (3) equipping generators with advanced meters so that real time locational marginal prices could be paid instead of retail rates.

Submetering Protocols for Multi-Tenant Buildings

To help encourage the installation of renewable energy at multi-tenant commercial and residential buildings, the strategy recommends that the legislature allow for submetering of electricity produced on site by the landlord in a multi-tenant building. This would allow a landlord to install generation on a building and charge its tenants for the use of electricity generated in or on the building. Current law specifically allows submetering at campgrounds and marinas.

Work with Municipalities to Decrease In-State Renewable Costs

The strategy recommends that the state and municipalities work together to streamline permitting, siting, and other requirements to help reduce the costs of solar photovoltaic installations that are not directly related to equipment and installation (i.e., the "soft costs"). It also suggests expanding CEFIA's Solarize program which pools solar installation jobs, thereby allowing contractors to reduce the cost of acquiring customers by bidding on a larger quantity of installations at one time.

Engage in Regional and Federal Regulatory Processes

The strategy recommends that DEEP's Bureau of Energy and Technology Policy increase the state's engagement with the Federal Energy Regulatory Commission (FERC) and ISO-New England, the federal entities which regulate the electricity transmission system, on issues such as (1) aligning markets and planning, (2) the region's increased reliance on natural gas for electricity production, and (3) ensuring that electricity markets provide participants with only the level of incentives needed to ensure an adequate level of supply.

Strengthen the Regional Carbon Dioxide Cap

In 2008, Connecticut joined eight other states to implement the Regional Greenhouse Gas Initiative (RGGI), the nation's first mandatory carbon dioxide cap and trade program. Because regional emissions have been significantly lower than the current regional carbon dioxide cap, the strategy recommends that the state work with other states to adjust the cap to ensure the program continues to incentivize better environmental outcomes. Its suggestions include lowering the emissions cap, requiring periodic compliance checks, and ensuring that the state's proceeds are put to their best use through cost benefit analysis.

Develop and Deploy Microgrids

The strategy recommends following up on the microgrid pilot program created by PA 12-148 to identify successes and difficulties and craft recommendations for a larger program. For additional details on the microgrid pilot program, see OLR Report 2012-R-0417.

Implement the Reliability Recommendations of the Two Storm Panel

Although many of the Two Storm Panel's recommendations have been implemented, the strategy recommends that DEEP additionally investigate the physical and fiscal issues associated with developing distributed power generation in critical areas and town centers. This would include reviewing energy improvement districts, use of microgrids, and potential legislative fixes to address rights-of-way issues.

The strategy also suggests that DEEP follow-up on the recommendations of the Geospatial Information Systems (GIS) Council Storm Response and Recovery Assessment Group to require electric utilities to develop GIS applications incorporating information from advanced meters, grids, and mobile data terminals to facilitate real-time sharing of data on service outages.

Evaluate Options for Waste-To-Energy

The strategy recommends a study on the viability of the state's waste-to-energy facilities, which have been facing reduced revenues, unsold renewable energy credits, and increased costs.

INDUSTRY

The strategy discusses six proposals ultimately aimed at helping the state's industrial customers reduce current energy costs, stabilize future energy costs, improve competitiveness, and reduce environmental impacts. The proposals focus on (1) reducing electricity rates and costs, (2) reconfiguring energy efficiency programs, (3) enabling fuel switching, (4) removing barriers to combined heat and power (CHP) use, (5) encouraging water conservation, and (6) creating an Advanced Energy Innovation Hub through UConn.

Reduce Electricity Rates and Costs

Because electricity costs can often be a significant part of an industry's operating expenses, the strategy recommends steps to ensure that the state's industrial customers gain the benefits of decreasing electricity prices. In particular, it suggests further efforts to educate industrial customers on the price benefits of switching to a competitive retail electric supplier, instead of their local utility.

Reconfigure Energy Efficiency Programs to the Needs of Industry

The strategy notes that reducing industrial electricity consumption would be one of the most productive ways to lower costs for the state's companies. To that end, it recommends adjusting energy efficiency programs to focus on industry needs. In particular, it suggests expanding funding for the Process Re-engineering for Increased Manufacturing Efficiency (PRIME) program, which provides lean manufacturing training that promotes energy savings through productivity increases.

Enable Fuel Switching to Cheaper and Cleaner Fuels

The strategy recommends the state (1) promote opportunities for commercial and industrial customers on existing gas mains to switch to natural gas and (2) authorize utilities to extend the system for "off main" customers when the cost benefit of conversion is positive. Greater details on the conversion recommendations are discussed in the strategy's section on natural gas.

Remove Known Barriers and Refine Combined Heat & Power Strategy

According to the strategy, CHP systems, which capture and use the heat generated in a facility's power plant, can offer an industry significant savings on electricity and heating expenses. To more fully capture potential CHP benefits, the strategy recommends expanding the CHP incentive program administered by DEEP to allow larger projects to participate. Under current law, the DEEP program is limited to projects under 1 megawatt. Changes to the program's size limits would have to be made legislatively.

Encourage Water Conservation

To promote water conservation and efficiency, the strategy recommends that PURA establish water rates that encourage conservation (similar to the decoupling recommendation for electric companies). It also recommends that the legislature increase the Water Infrastructure Conservation Adjustment (WICA) surcharge from 5% to 10% to allow water companies to better repair and replace aging and inefficient infrastructure.

Launch an Advanced Energy Innovation Hub

The strategy recommends that DEEP and UConn launch an Advanced Energy Innovation Hub to develop energy technologies. DEEP will provide a portion of the hub's funding for the first four years and the university will match this support and seek additional sources of funding. Research will initially focus on fuel cells, microgrid engineering, batteries and storage, and small-scale hydropower.

TRANSPORTATION

According to the draft strategy, the transportation sector accounts for 32% of the state's total energy consumption and oil in the form of gasoline and diesel fuel comprises 95% of the energy used by the sector. This dependence leaves the public exposed to price spikes caused by global markets beyond the state's influence. The sector also produces about 40% of the state's greenhouse gas emissions.

The strategy argues that reducing the amount of gasoline and diesel fuel consumed by Connecticut cars and trucks would bring significant economic benefits, notably, potential lower costs and fewer dollars shipped overseas. In addition, reducing consumption of these fuels would have environmental and public health benefits, including improved air quality and lower greenhouse gas emissions.

The strategy states that it avoids trying to guess what the state's vehicle fuel of choice will be in 2020 or 2030. Rather, it proposes building a basic platform for many options, with a sufficient diverse refueling infrastructure to allow Connecticut drivers to make choices. It calls for:

1. expanded commitment to transport-oriented development and a mobility focus that encourages bikeways, walking paths, and related investments;

2. secure funding for transportation infrastructure to reduce road congestion, improve air quality, and provide a strengthened platform for economic growth and job creation;

3. investing in a clean fuels and vehicles initiative that will ensure that the basic infrastructure needed for vehicle choice will be in place, including enough electric vehicle charging stations (about 100 statewide) so that no one in the state need suffer from "range anxiety";

4. support for converting fleets like delivery vans, taxis, and public works vehicles to natural gas in conjunction with private sector-funded construction of natural gas filling stations open to the public;

5. establishing a set of liquefied natural gas stations at truck stops to support the growing number of long haul trucking fleets considering conversion to natural gas;

6. expanded hydrogen filling stations as demand for fuel cell-powered vehicles grows; and

7. support for better fuel economy in Connecticut vehicles and development of second-generation biofuels such as biodiesel from food waste.

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